



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/670,052 | 09/23/2003 | Changwen Liu | 110466-163434 | 4753 |

31817 7590 08/14/2007
SCHWABE, WILLIAMSON & WYATT, P.C.
PACWEST CENTER, SUITE 1900
1211 S.W. FIFTH AVE.
PORTLAND, OR 97204

| |
|----------|
| EXAMINER |
|----------|

MUI, GARY

| | |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

2616

| | |
|-----------|---------------|
| MAIL DATE | DELIVERY MODE |
|-----------|---------------|

08/14/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/670,052

Applicant(s)

LIU, CHANGWEN

Examiner

Gary Mui

Art Unit

2616

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 June 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 13-16, 18-21, 25-32 and 38 is/are rejected.
- 7) ☒ Claim(s) 8-12, 17, 22-24 and 33-37 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 May 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date. _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1 – 3, 7, 26 – 28, and 32 are rejected under 35 U.S.C. 102(e) as being anticipated by Schollmeier et al. (US 2006/0221834 A1).

For claims 1 and 26, Schollmeier et al. teaches establishing a first directed path, having direction based path segments, from a source node to a target node; establishing a second directed path, having direction based path segments, from a source node to a target node; merging the first and second directed paths into a merged path; and dividing the merged path into a third and a fourth node-disjoint directed paths between the source node and the target node (see paragraphs 0004 and 0005, Schollmeier et al. teaches finding multiple paths from the source to target node, in which he groups them up to from a set of paths).

For claims 2, 3, 27, and 28, Schollmeier et al. teaches establishing the first directed path includes utilizing either a Generic Route Discovery Procedure or the Dynamic Source Routing protocol and establishing the second directed path includes utilizing a Generic Route Discovery Procedure (see paragraph 0015 lines 1 – 8).

For claims 7 and 32, Schollmeier et al. teaches adding the first directed path to the second directed path in such a manner that the direction based path segments of opposite direction are

removed from the merged path (see paragraph 0016 lines 1 – 10, the creation of the paths are disjunct from one another other paths are not part of the hammock set).

Claim Rejections - 35 USC § 102

3. Claims 14 – 16, 18, 19, and 25 are rejected under 35 U.S.C. 102(e) as being anticipated by Sahinoglu et al. (US 2005/0036486 A1).

For claim 14, Sahinoglu et al. teaches a transceiver to transmit and receive a wireless signal; a path generator to establish at least a first plurality of paths of communication, utilizing at least in part a wireless signal, between the source node and a target node; a path organizer to arrange a first plurality of paths generated by the path generator into a second plurality of paths that are node disjoint (see paragraphs 0008, 0009, 0010, and 0011, the source node generates route request packets to send to the destination and receives a route reply packet from the destination in which the source will make calculations on the multiple routes in the reply message).

For claim 15, Sahinoglu et al. teaches the path generator is capable of generating a first directed path and a second directed path, each directed path having direction based path segment (see paragraph 0011, multiple paths are generated directed towards the destination).

For claim 16, Sahinoglu et al. teaches the path generator is capable of generating a path utilizing a Generic Route Discovery Procedure (see paragraphs 0008 and 0009, route is generated by sending out a data packet to find the route).

For claim 18, Sahinoglu et al. teaches the path generator is capable of generating the second path via: broadcasting a route request (see paragraph 0038 lines 1 – 2); broadcasting

Art Unit: 2616

information about the first directed path with the route request; directing receiving nodes to forward the route request via receiving nodes until the request is received by the target node; directing receiving nodes to build the second directed path having path segments utilizing the path segments that the route request has traveled; and directing receiving nodes to prevent the second directed path from including directed paths segments found in the first directed path (see paragraph 0039, a second path is found where is can be at a lower cost then the first path).

For claim 19, Sahinoglu et al. teaches establishing the first and second paths substantially simultaneously (see paragraph 0038 lines 6 – 9 and 0039 lines 1 – 4, the broadcasted route request messages (RREQ) arrives at the destination and will send out a route reply (RREP) for each RREQ)

For claim 25, Sahinoglu et al. teaches the transceiver is capable of sending a wireless signal to a target node utilizing any one of the paths of the second plurality of paths that are node disjoint (see paragraph 0011 lines 2 – 4; the best route is selected for sending a signal).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2616

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sahinoglu et al. in view of Schollmeier et al.

For claim 20, Sahinoglu et al. teaches all of the claimed subject matter with the exception of combining the first plurality of paths into a merged path, and dividing the merged path into a second plurality of paths that are node disjoint. Schollmeier et al. from the same field of endeavor teaches for each input to destination network node pair, multipath routing generates a number of transmission paths or routing paths respectively, also referred to as a hammock. The sum of all the transmission paths from all input network nodes to an output network node is referred to as a hammock set. Accordingly for each output network node there is a hammock set (see paragraphs 0004 and 0005). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine and divide the paths as taught by Schollmeier et al. into the route discovery of Sahinoglu et al. The motivation for doing this is with multiple paths the likelihood the packet will reach its destination increases.

For claim 21, Sahinoglu et al. teaches all of the claimed subject matter with the exception of the first plurality of paths, includes a plurality of directed paths, each directed path having

Art Unit: 2616

direction based path segments; and wherein the path organizer is capable of combining the first set of paths into a merged path via adding the first set of paths together, such that path segments of opposite directions cancel out. Schollmeier et al. from the same field of endeavor teaches the network nodes contained in these disjunct transmission paths are then partially, ideally as completely as possible, directly connected with each other in the direction of the target network nodes or else corresponding transmission paths established so that, at least two paths are respectively created in the direction of the target network nodes in respect of one network node of a disjunct transmission path. The direction of the transmission path or connection in the direction of the target network nodes is required in order to avoid routing loops (see paragraph 0016 lines 1 – 10, the creation of the paths are disjunct from one another other paths are not part of the hammock set).

Claim Rejections - 35 USC § 103

7. Claims 4 – 6, 13, 29 – 31, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schollmeier et al. in view of Sahinoglu et al.

For claims 4 and 29, Schollmeier et al. teaches all of the claimed subject matter with the exception of broadcasting a route request (see paragraph 0038 lines 1 – 2), broadcasting information about the first directed path with the route request; forwarding the route request via receiving nodes until the request is received by the target node; building the second directed path having path segments utilizing the path segment that the route request has traveled; and preventing the second directed path from including directed path segments found in the first directed path. Sahinoglu et al. from the same field of endeavor teaches the source node

initiates a route request by broadcasting the RREQ packet (see paragraph 0038 lines 1 – 2). The result is that the destination node generates and unicast another RREP packet to the source node whenever it receives a RREQ packet with a yet another lower cost than known before. The overall effect is that the route discovery generates multiple RREQs packets from the source node to the destination node, and multiple RREP packets from the destination node to the source node, and the source node must perform cost calculations on the multiple RREP packets to determine a RREP route to use for transmitting data packets. Thus, cost calculation in RREQ packets mandates cost calculation in RREP packets for cost effective route discovery (see paragraph 0039). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to discover a route as taught by Sahinoglu et al. route discovery of Schollmeier et al. The motivation for doing this is to have reliable data packet transmission in the case of link or node failures.

For claims 5 and 30, Schollmeier et al. teaches all of the claimed subject matter with the exception of broadcasting an on-demand flooding route request. Sahinoglu et al. form the same field of endeavor teaches the use of AODV (ad hoc on-demand distance vector) protocol for route discovery (see paragraph 0032 lines 1 – 10). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to broadcast the route request as taught by Sahinoglu et al. into the route discovery procedure as taught by Schollmeier et al. The motivation for doing this is to be able to effectively transmit packet using the most updated paths.

For claims 6 and 31, Schollmeier et al. teaches all of the claimed subject matter with the exception of establishing the first and second paths substantially simultaneously. Sahinoglu et

Art Unit: 2616

al. form the same field of endeavor teaches the RREQ packet, with different accrued cost, arrive at the destination node in some unknown order, after experiencing various time delay, depending on the routes the RREQ packets traveled (see paragraphs 0038 lines 6 – 9, the broadcasted route request messages (RREQ) arrives at the destination and will send out a route reply (RREP) for each RREQ).

For claims 13 and 38, Schollmeier et al. fails to teach that the two-node disjoint paths include both wireless path segment and wired path segments. However, Sahinoglu et al. form the same field of endeavor teaches the route discovery in an ad-hoc network and Schollmeier does teach that the paths are discovered in a packet switched communication network. The packet switch communication network can be a combination network of both wired and wireless networks. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to have both wireless and wired path segments in the routing path. The motivation for doing this is to have efficient data packet transmission because some paths are stable and will not be roaming.

Allowable Subject Matter

8. Claims 8 – 12, 17, 22 – 24, and 33 – 37 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

For claims 8, 22, and 33, the prior art fails to teach alone or in combination the adding of the paths is based on vector based addition.

Art Unit: 2616

For claims 9, 23, and 34, the prior art fails to teach alone or in combination the steps of determining two paths are between the same nodes but of opposite direction; if so, removing the segments from the merged path and repeating the steps.

For claims 10 – 12, 24, and 35 – 37, the prior art fails to teach alone or in combination of forming a polygon, removing the interior paths, and that the exterior path of the polygon is the merged path.

Response to Arguments

9. Applicant's arguments filed June 13, 2007 have been fully considered but they are not persuasive.

In response to the remarks on page 14 –15, the applicant argues that the reference Schollmeier et al. (hereinafter “Schollmeier”) does not teach or suggest “dividing, by the source node, the merged path into a third and fourth node-disjoint directed paths between the source node and the target node”. The examiner respectfully disagrees.

Schollmeier et al. teaches the generating a plurality of paths and the combining them to form a hammock set. Schollmeier goes on to teach how multiple paths are created and are not loop free or disjunction and will create disjunct loop free multipath transmissions. This multiple paths are still divided amongst each other to provide for a reliability transmission system, wherein one can act as a primary path and the other as a backup path (see paragraphs 0004 – 0016). Therefore, Schollmeier does teach all of the claimed subject matter.

In response to the remarks on page 15 – 16, the applicant argues that the reference of Sahinoglu et al. (hereinafter “Sahinoglu”) does not teach or suggest “a path organizer to

Art Unit: 2616

arrange the first plurality of paths generated by the path generator into a second plurality of paths that are node disjoint". The examiner respectfully disagrees. Sahinoglu teaches generating routes from a source node to a target node where the routes can be XDGFZ or XABCZ, which are node-disjoint (see paragraph 0034). Therefore, Sahinoglu does teach all of the claimed subject matter.

In response the remarks on page 17 – 18, applicant argues that the Schollmeier does not cure the deficiencies of Sahinoglu and Sahinoglu does not cure the deficiencies of Schollmeier. The examiner respectfully disagrees. See explications above for show Schollmeier or Sahinoglu teaches the claimed subject matter.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Art Unit: 2616


11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gary Mui whose telephone number is (571) 270-1420. The examiner can normally be reached on Mon. - Thurs. 9 - 3 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on (571) 272-3139. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

GM


09-03-2007


RICKY Q. NGO
SUPERVISORY PATENT EXAMINER